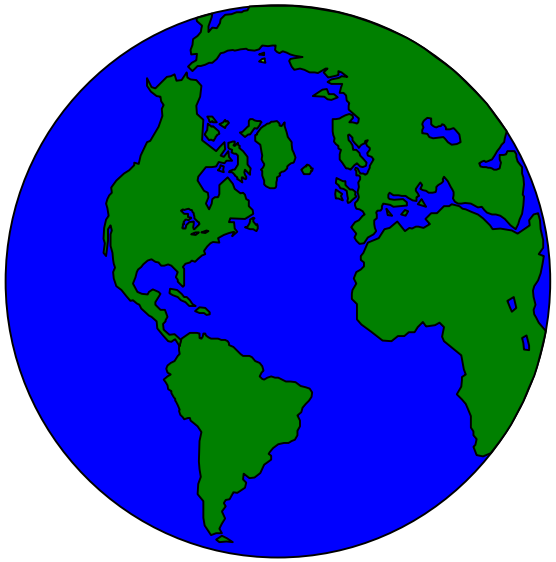
Health Care Without Harm

The Campaign for
Environmentally Responsible
Health Care



Web site: www.noharm.org

The Mission of Health Care Without Harm

- To transform the health care industry so it is no longer a source of environmental harm by eliminating pollution in health care practices without compromising safety or care.

We will accomplish this mission by:

- Promoting comprehensive pollution prevention practices.
- Supporting the development and use of environmentally safe materials, technology and products.
- Educating and informing health care institutions, providers, workers, consumers, and all affected constituencies about the environmental and public health impacts of the health care industry and solutions to its problems.

Health Care Without Harm Campaign Goals

- To work with a wide range of constituencies for an ecologically sustainable health care system
- To eliminate the non-essential incineration of medical waste and promote safe materials use and treatment practices
- To phase out the use of PVC (polyvinyl chloride) plastics and persistent toxic chemicals and to build momentum for a broader PVC phase out campaign
- To phase out the use of mercury in the health care industry

•Health Care Without Harm Campaign Goals

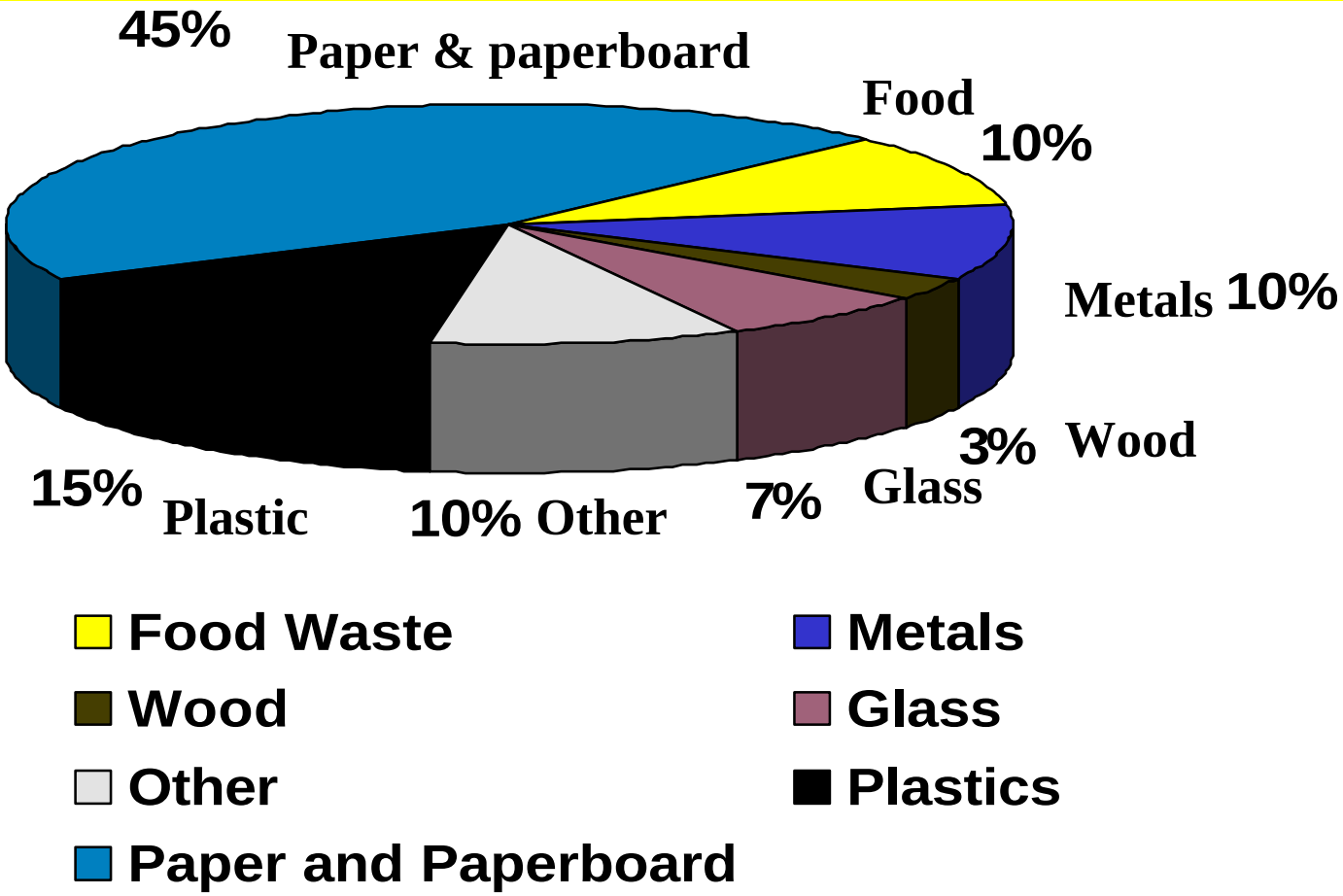
(continued)

• To develop health-based standards for medical waste management and to recognize and implement the public's right to know about chemical usage in the health care industry.

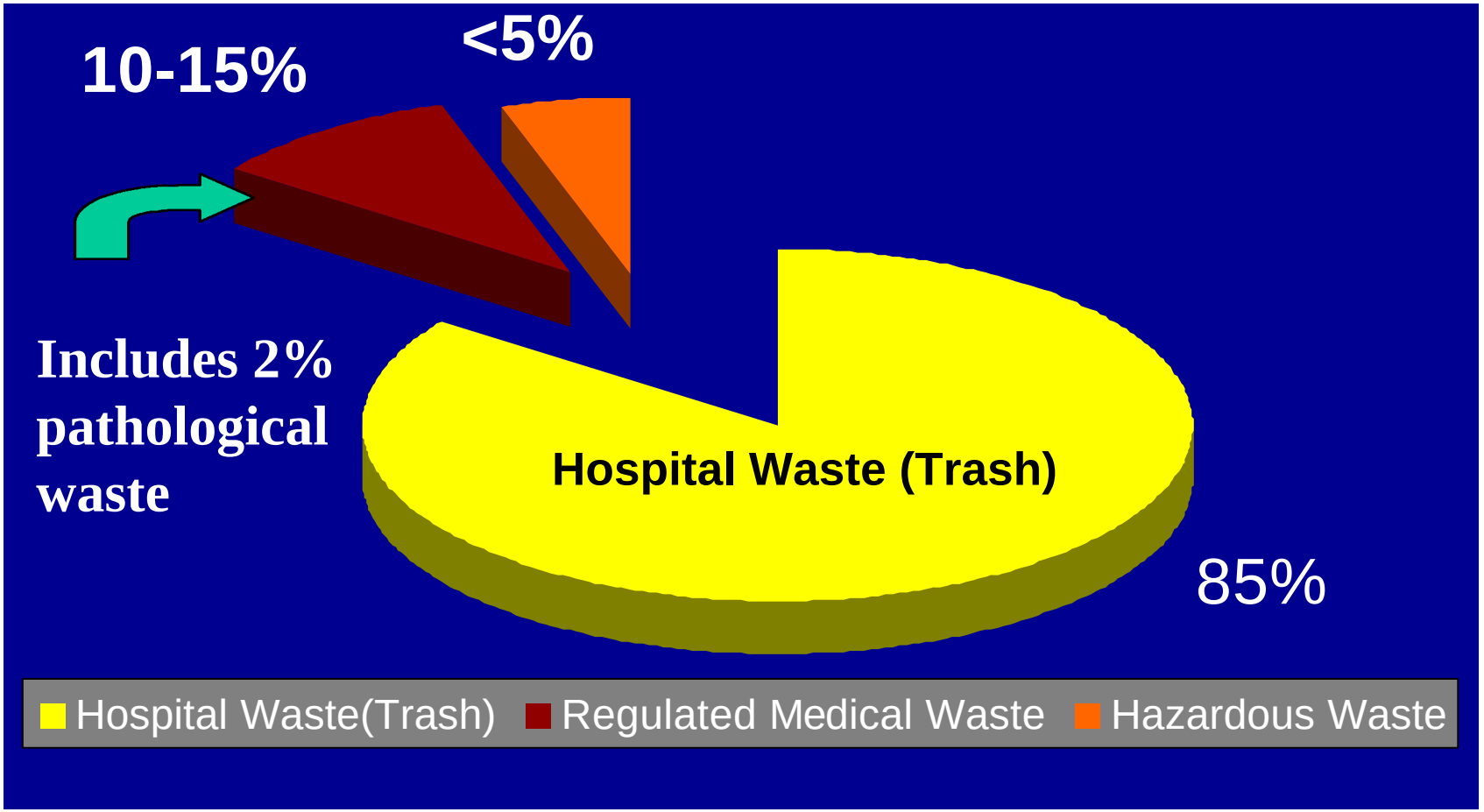
• To develop just siting and transport guidelines that conform to the principles of environmental justice: "no communities should be poisoned by medical waste treatment and disposal"

• To develop an effective collaboration and communication structure among campaign allies.

Hospital Waste, Like Household Trash, Is Largely Recyclable



Most Hospital Waste Is Simply “Trash”



Definition of Regulated Medical Waste by AORN*

- Cultures and stocks of infectious waste
- Animal waste, bedding & carcasses in contact with infectious agents
- Waste from Class 4 infectious agents
  [certain highly virulent diseases, e.g., Lassa Fever]
- Sharps (used & unused)

* **American Operating Room Nurses**

Medical Waste - The Problem
Volume & Toxicity

- Volume-
  - Estimated 2 million tons of regulated medical waste annually in US
- Toxicity of Hospital Waste
  - Heavy metals- e.g., mercury in fluorescent lights, batteries, & medical devices; Cadmium in red bags
  - PVC- when incinerated, produces dioxin
- Hazardous waste

  [characteristics of hazardous waste = ignitable, toxic, corrosive, reactive, radioactive.]
  - Solvents, lab chemicals, isotopes, waste anesthetic gases, etc.
- Medical Waste Incinerators
  - Leading source of environmental dioxin & mercury

Alternatives to Incineration

**(Medical Waste Incineration
Leading Source of Mercury & Dioxin)**

REDUCE - REUSE- RECYCLE

- **Opportunities in Purchasing**

"Purchasing holds the keys to the kingdom" Hollie Shaner

- **Segregate the Waste Stream**
  - **-Eliminate unnecessary red-bagging**
- **Recycling Opportunities**
  - **-Mercury which is being used can be recycled**
  - **-Problems with PVC recycling**
- **Waste Treatment Options**
  - **-Autoclaving**
  - **-Various Thermal and Chemical Treatments**
  - **-Microwaving, High Temperature Electric Arc**

Sources of Environmental Mercury from Human Activity

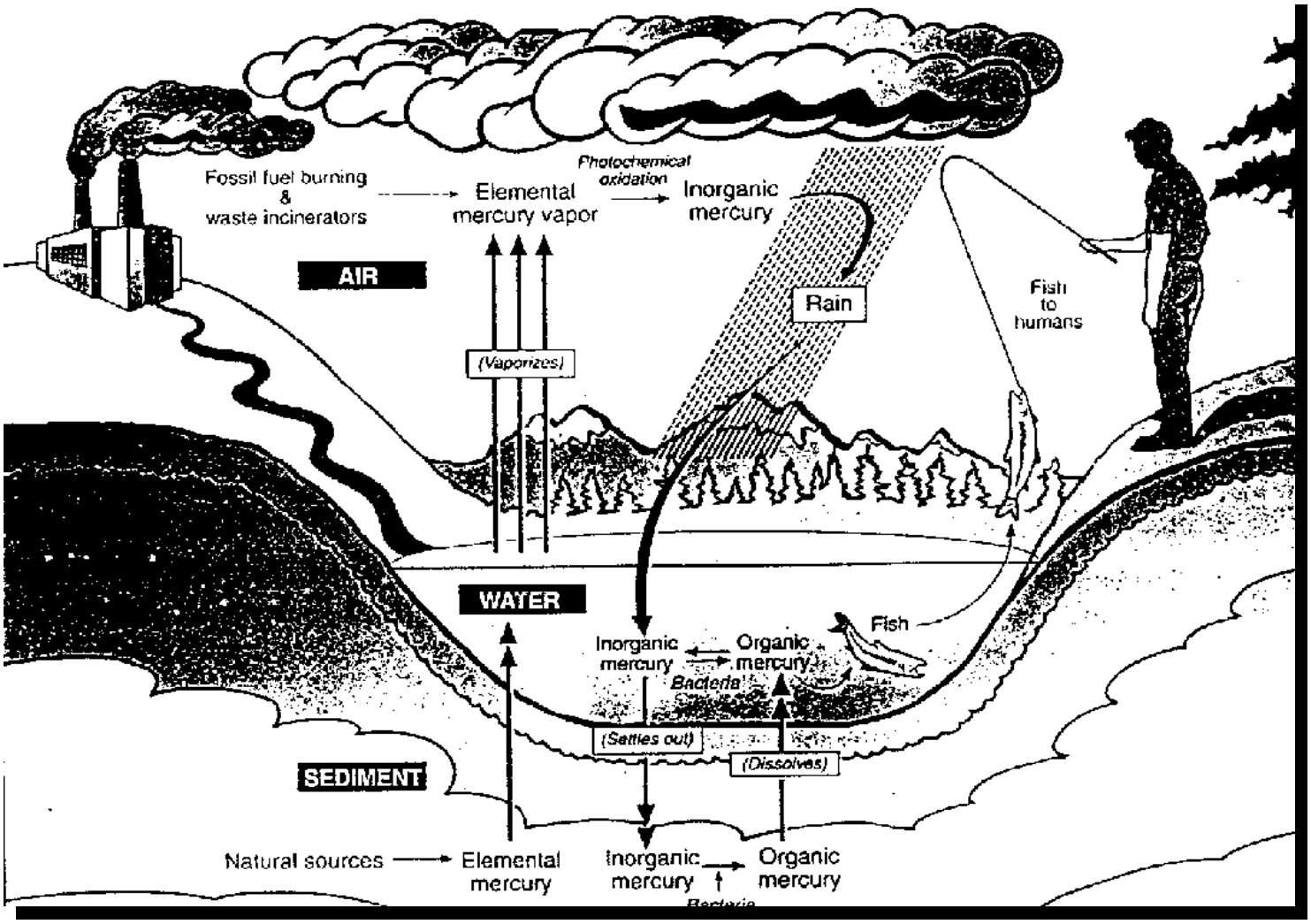
- Estimated 243 tons of mercury from human activity in US annually

- Approximately 85% of this estimate from combustion point sources including:
  - Medical waste incinerators 10%
  - Municipal waste incinerator 18%
  - Coal fired utility power plants 33%
  - Industrial boilers 18%

US EPA

Source	Mercury Emissions		
	Mg/ yr	Tons/ yr	% of total
Utility boilers - coal - oil - natural gas	47.2 (46.9) (0.2) (0.002)	51.8 (51.6) (0.2) (0.002)	32.8
Municipal waste combustors	26.9	29.6	18.7
Commercial/Industrial boilers - coal - oil	25.8 (18.8) (7.0)	28.4 20.7) (7.7)	17.9
Medical Waste Incinerators	14.6	16.0	10.1
Hazardous waste combustors	6.4	7.1	4.4
Residential boilers - coal - oil	3.3 (0.4) (2.9)	3.6 (0.5) 3.2)	2.3
Sewage sludge incinerators	0.9	1.0	0.6
Wood-fired boilers	0.2	0.2	0.1
Crematories	0.0005	0.0006	0.0
Total	125.2	137.9	86.9

Mercury Cycle



Organic (Methyl) Mercury Exposure (Human)

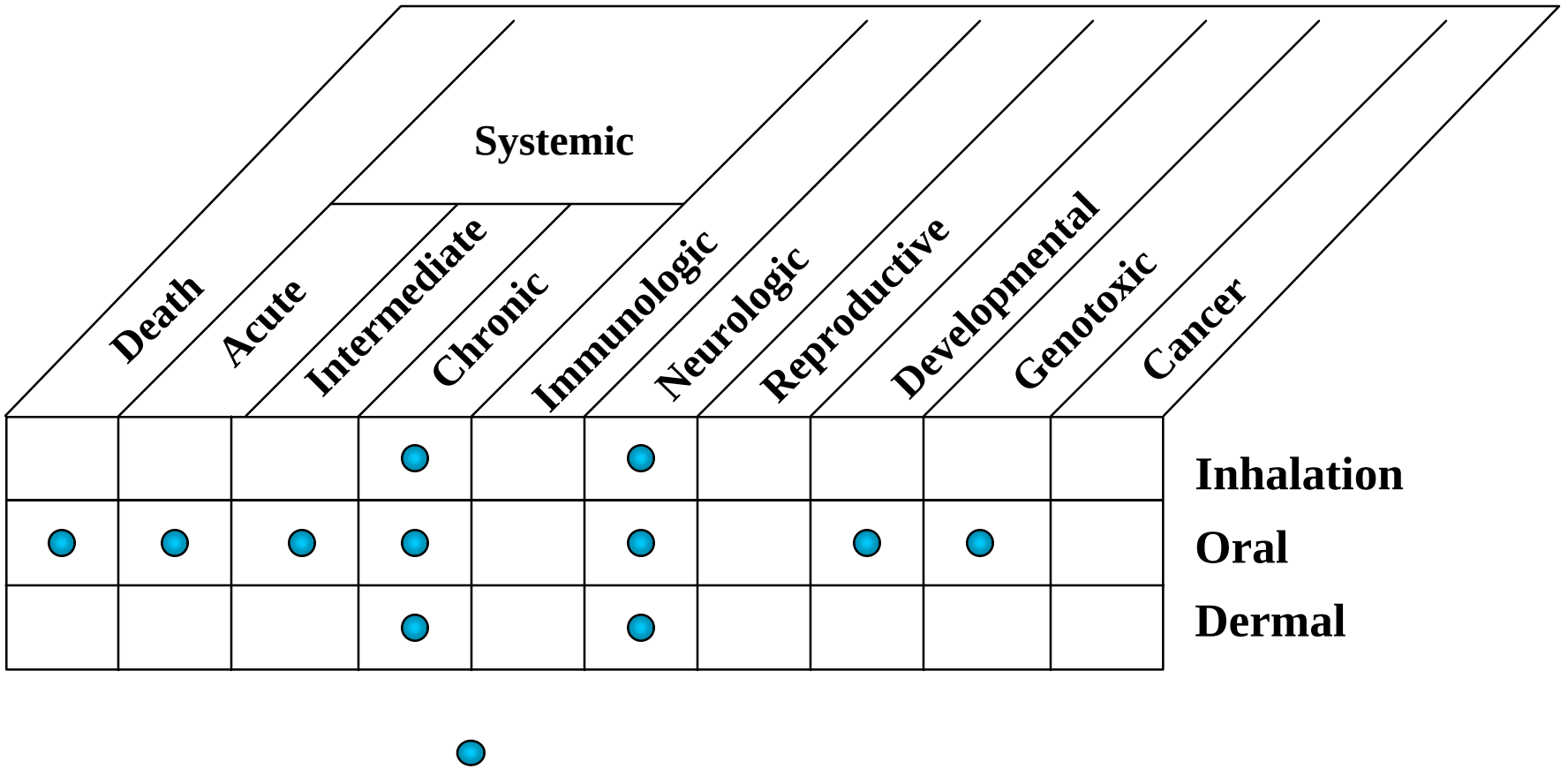
- Fish consumption advisories in over 40 states because of mercury contamination.
- 5 million people regularly eat contaminated fish from the Great Lakes.
- Subsistence fishers and their children are at particular risk of adverse health effects.

Mercury is A Potent Neurotoxin

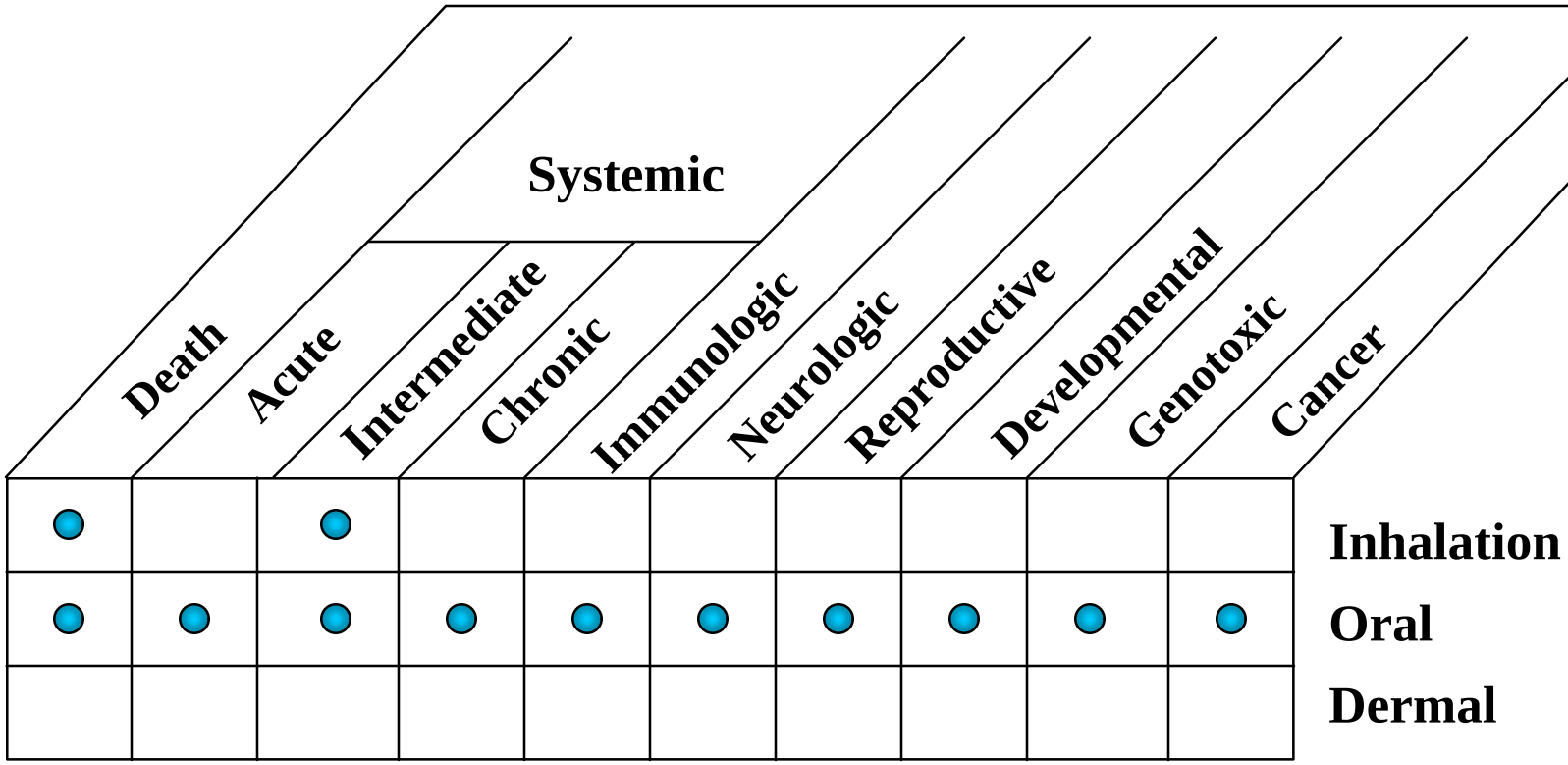
Symptoms of Mercury Poisoning

- Impairment of peripheral vision
- Disturbance in sensations
- Lack of coordination of movements
- Impairment of speech or hearing
- Muscle weakness
- Skin rashes
- Mood swings, mental disturbances
- Developmental-interferes w/ normal brain development; impaired memory, attention, & learning

Health Effects of Methyl Mercury on Humans



Health Effects of Methyl Mercury on Animals



● Existing Studies (ATSDR 1998)

Mercury in Health Care Organizations

The Obvious

- Thermometers
- Sphygmomanometers
- Miller-Abbott tubes
- Cantor tubes
- Esophageal bougies
- Laboratory Chemicals
- Thermostats
- Fluorescent lamps
- Batteries

The Not So Obvious

- Caustic Soda
- Laundry Chemicals-Bleach
- Antibacterial Soaps
- Boiler & Air Conditioning Chemicals
- Reagents
- Dental Amalgams (disposal issue)
- Plastics

Mercury in Health Care Organizations

- Can mercury be eliminated altogether?
  - Yes. Alternatives exist for mercury based technologies.
- What would the benefits be?
  - Reduced occupational exposure to mercury, less mercury in medical wastes and in effluent water, less expense to organizations with mercury spill readiness plans and training.
- What are the obstacles?
  - Reluctance to change, lack of awareness of alternatives and economics, disposal costs of old mercury. Real challenges in the phase-out for discrete groups such as neonates, where accuracy is essential.

Health Care Products Containing Mercury (Hg) and Alternatives

• Product	• Alternatives
– Hg batteries	– Lithium, zinc air, alkaline
– Esophageal devices, cantor & miller abbott tubes	– Products w/ tungsten tubing Anderson AN-20
– Hg thermometers	– Digital, expansion or aneroid
– Hg based blood pressure monitoring devices	– Electronic vacuum gauge, expansion or aneroid
– Lamps & lighting devices	– Non-Hg based-sodium vapor,glow lights, optical
– Hg switches	– Non-Hg switches
– Hg dental amalgams (disposal issue)	– Gold, ceramic, porcelain [Hg in chemical analysis can be phased out in many cases]

It Can Be Done !
Case Study / Butterworth Hospital,
Grand Rapids, Michigan
Mercury Abatement Policy

- The Purchasing Department will make every attempt to not purchase any product that contains mercury. This list of products includes, but is not limited to, sphygmomanometers, diffusion pumps, esophageal dilators, and mercury electrodes.

- The Purchasing staff will work with the requisitioning departments to find alternate products to acquire in place of the products that contain mercury. For example, disposable thermometers will be replaced by digital thermometers or disposable temperature strips. Mercury filled sphygmomanometers will be replaced with digital ones.

- The Environmental Services Director will be notified if the mercury containing product has to be purchased because there is no substitute product available.

Beth Israel Medical Center (BI), NYC
Reducing Wastes and Cutting Costs

- Janet Brown (Waste Manager) designed a red bag waste segregation program. She combined this with a rigorous monitoring system, employee education and strategic placement of waste bins. This effort dramatically reduced the amount of red bag waste generated.

- Current estimates suggest that the hospital has saved well over $ 600,000 per year on medical waste costs and over $900,000 on all waste.

- Waste segregation programs like the BI's demonstrate that hospitals can reduce waste cost and remain in regulatory compliance.

Dioxin: Where Does It Come From & What Are Its Effects

- Dioxin is a byproduct of incinerated waste, including medical waste, as well as certain chemical processes and paper manufacturing methods.

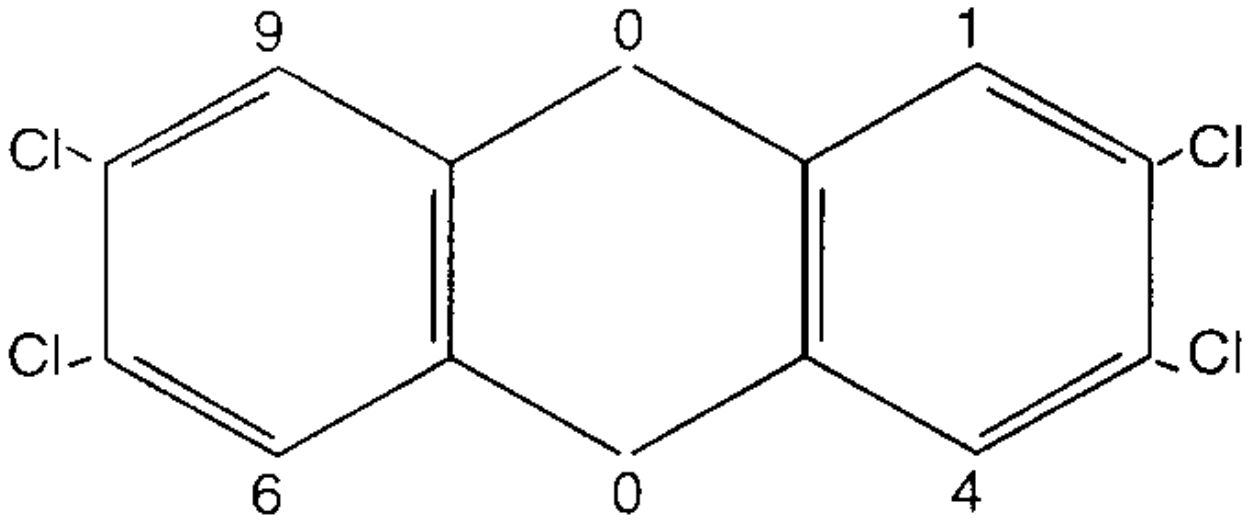
- A single very small dose (less than one-millionth of a gram per kilogram of body weight) on day 15 of pregnancy in the rat causes decreased sperm count, delayed testicular descent, and feminized sexual behavior in male offspring.

  – Mably et al., 1992 Toxicology and Applied Pharmacology , Vol.. 114: 97-126

- Dioxin is a potent toxin at very low-levels of exposure, and is persistent in the environment.
- Approximately 7 year half-life in humans.

Diagram of Dioxin Molecule

Diagram of 2,3,7,8-TCDD



Dioxin As A Carcinogen In Humans

The U.S. EPA and the International Agency for Research on Cancer (IARC) have determined that exposure to dioxin causes cancer in humans.

How Dioxin Enters the Food Chain

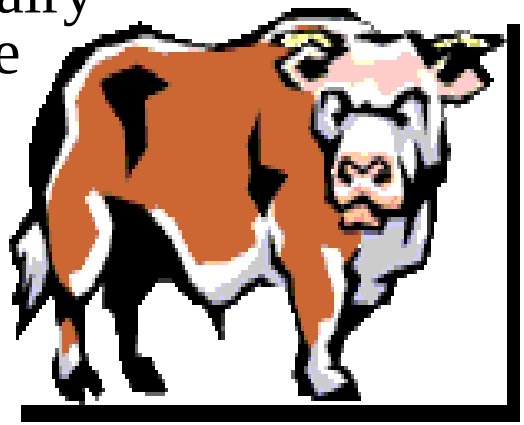
•Particles are distributed via incineration into the atmosphere by wind & rain.

• Particles lodge in soil, in lakes & in rivers, settle on plants.

• Animals eat & drink dioxin particles.

•Dioxin bioaccumulates in the fatty tissue of animals.

• Humans consume contaminated fish, meat and dairy products, and receive the bioaccumulative dose the animal incurred over its lifespan.

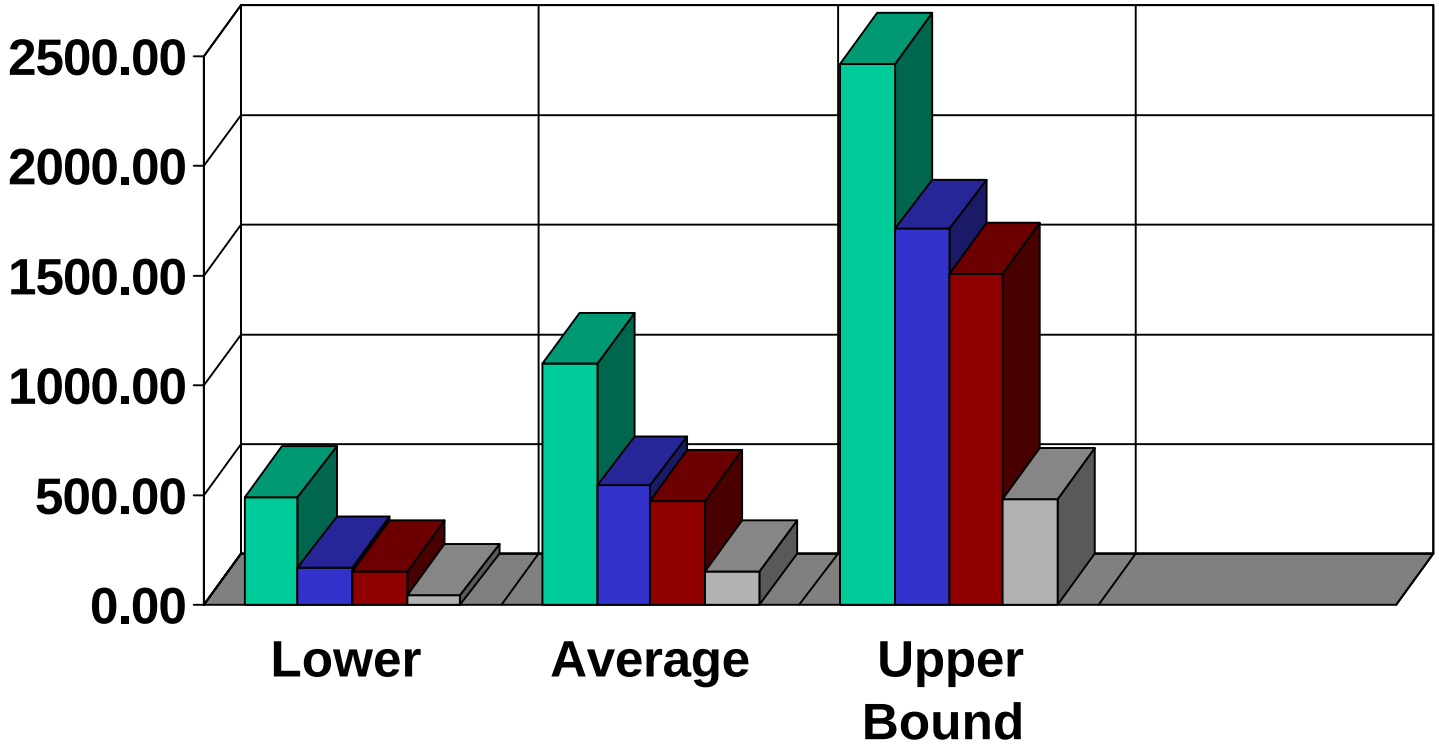


Dioxin Emissions To Air in Grams of Toxic Equivalents/Year

U.S. EPA

U.S. Combustion Source Inventory

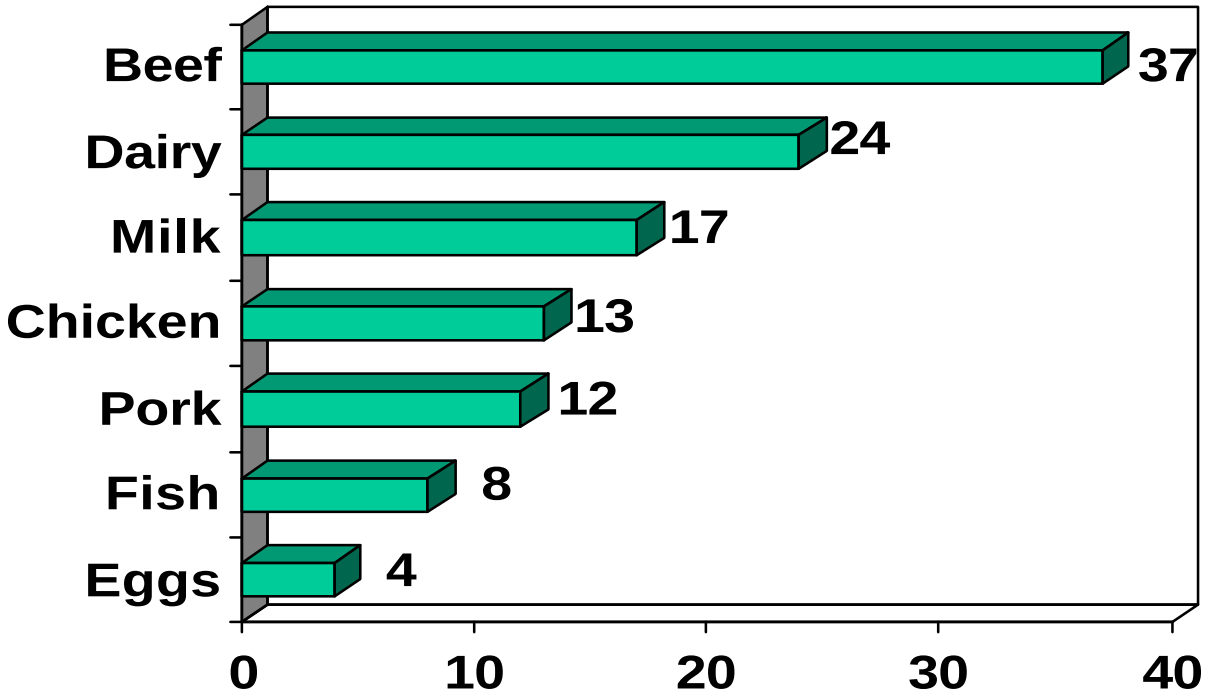
Four Top Dioxin Polluters 1995



Dioxin Contamination

Incinerators at this plastics facility (Borden Plant) in Geismar, Louisiana's "Cancer Alley" spew dioxin into the air every day. The dioxin then drifts downwind, contaminating our food chain like radioactive fallout.

Daily Intake (pg) of Dioxin in Toxic Equivalents



Source: USEPA, 1994d

U. S. Environmental Protection Agency

In the U.S. EPA's 1994 Dioxin Reassessment, it estimates that the average levels of dioxin in all Americans is "at or approaching levels" where we can expect to see a variety of health effects. The EPA also estimates that adults consume 300-600 times the daily "safe" dioxin intake levels set by the Agency, while children consume 50 times more than the "safe" adult levels.

In short, Americans have reached maximum thresholds of dioxin, making it a public health necessity to stop dioxin pollution at its sources.

World Health Organization (WHO) Re-Evaluates Health Risks From Dioxin

"In 1990 WHO experts established a TDI (tolerable daily intake) of 10 picograms/kilogram body weight for dioxin -TCDD. (One picogram equals a millionth of a millionth of a gram).

Since then new epidemiological data has emerged, notably concerning dioxins' effects on neurological development & the endocrine system… After ample debate the specialists agreed on a new tolerable daily intake range 1 to 4 picograms/kilograms body weight. The experts, however, recognize that subtle effects may already occur in the general population in developed countries at current background levels of 2 to 6 picogrames/kilogram body weight.

They therefore recommended that every effort should be made to reduce exposure to the lowest possible level. "

WHO Press Release/45 June 1998

Dioxin Equivalents Consumed Each Day at Different Ages

Age	pg/kg/day
Breast-fed infant	34-53
Formula-fed infant	0.07-0.16
1-4	1-32
5-9	1-27
10-14	0.7-16
15-19	0.4-11
Adult>20	0.3-3

Source: Schecter, 1994c

Human Health Effects of Dioxin

Cancer

- Increased cancer mortality overall

Neonatal Abnormalities

- Change in sex ratio
- Altered level of thyroid hormone

Skin Disorders

- Porphyria cutanea tarda
- Chloracne

Immune System

- Change in immune system parameters / modulation

Endocrine System Effects

- Low levels of testosterone
- Increase glucose intolerance or diabetes
- Decreased estrogen & estrogen-receptor levels after fetal exposure

Health Effects of Dioxin in Animal Studies

Cancer

- Multiple sites

Fetal Abnormalities

- Cleft Palate
- Hydronephrosis
- Abnormalities in the reproductive organs
- Neurological problems
- Developmental delays

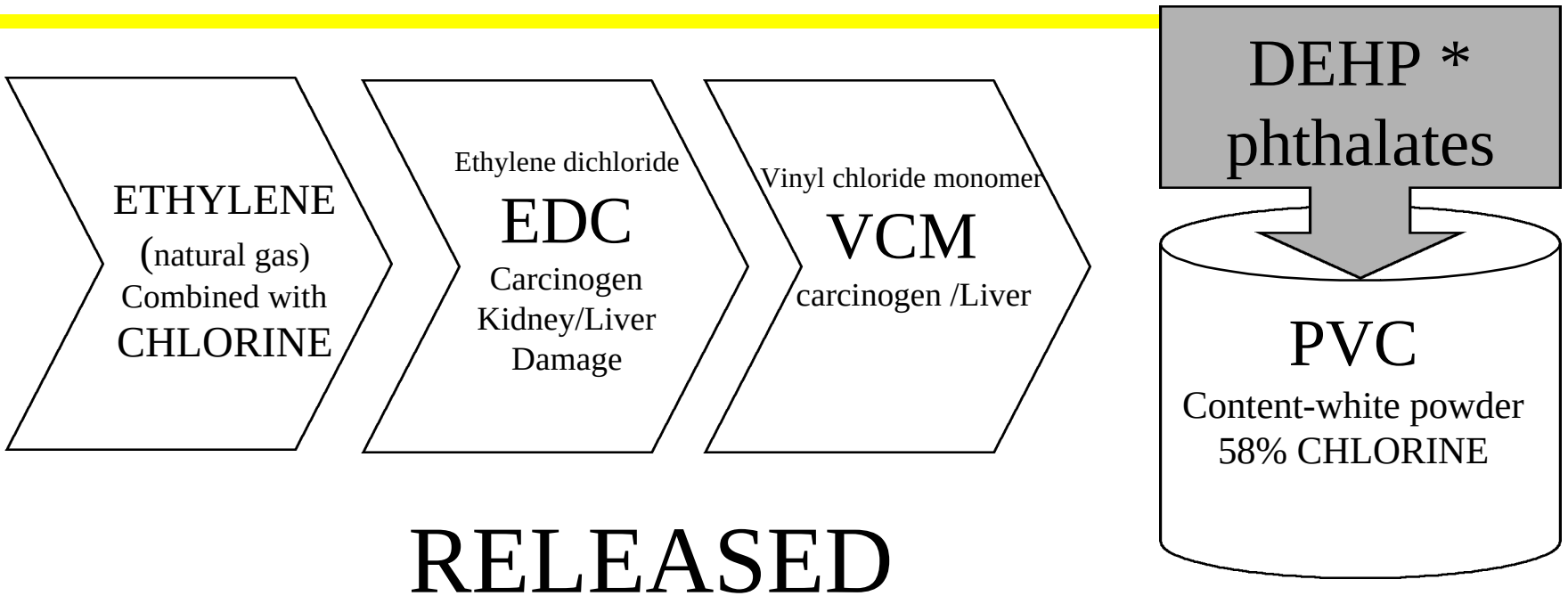
Reproductive Toxicity

- Decreased testis size
- Feminization of behaviors
- Adverse pregnancy outcomes
- Ovarian dysfunction

Endocrine System Alterations

- Altered glucose intolerance
- Altered fat metabolism
- Changes in thyroid hormone
- Decreased estrogen & estrogen-receptor levels after fetal exposure

The PVC Life Cycle



RELEASED

Dioxin Dioxin Dioxin

* Di-2-ethylhexyl phthalate (DEHP) is used to make PVC flexible

The PVC Life Cycle

(continued)

- The lifecycle hazards of PVC include:
  - 1. Releases of toxic byproducts of production (e.g., dioxin).
  - 2. The release of toxic additives during use (e.g., phthalates, heavy metals).
  - 3. Creation of dioxin when PVC is burned (e.g., in incineration or accidental fires).
  - 4. Contamination of recycling process.

Polyvinylchloride Plastic

PVC is the Major Chlorine Donor for Dioxin Formation in M W I

- Dioxin generation depends on:
  - Waste stream composition (you need chlorine to make dioxin).
  - Incinerator design & operating conditions.

  A majority of laboratory & full-scale incineration studies demonstrates a positive association between chlorine (PVC) inputs and dioxin emissions from incinerators. The industry's study (Rigo Report) is contrary to the preponderance of studies in the literature.

PVC is the Major Chlorine Donor for Dioxin Formation in MW I

- "…we are convinced that, when all other factors are held constant, there is a direct correlation between input PVC and output PCDD/PCDF and that it is purposeful to reduce chlorinated plastics inputs to incinerators."

John C. Wagner & Alex E.S. Green, "Correlation of Chlorinated Organic Compound Emissions from Incineration With Chlorinated Organic Inputs," Chemosphere, Vol. 26, No. 11, pp 2039-2054, 1993.

Vinyl Institute's Study of Incineration and Dioxin Production

- The Rigo Report--commissioned by the Vinyl Institute & Environment Canada--flawed analysis & conclusions.
  - Used data collected for other purposes
  - Did not measure all dioxin produced
  - Measured dioxin at different points in exhaust stream
  - Failed to correct for other variables
  - Did find a relationship but reported it "not statistically significant"

Growth in PVC Sales*

North America

- 1965 2 billion pounds
- 1975 4 billion pounds
- 1985 8 billion pounds
- 1995 12 billion pounds

* Domestic & Export Sales

Source: The Geon Company

- 25% of all health care products contain PVC

PVC in Medical Products

- IV bags
- Blood bags
- IV and respiratory therapy tubing
- Venodyne sleeves
- Patient ID cards
- Water bed liners
- Rigid packaging trays
- Mattress covers
- X-Ray folder holders
- Shower curtains
- Dialysis bags
- Thermal blankets

What Health Care Organizations Can Do To Phase Out PVC

- Work with purchasing and procurement to identify viable product substitutes
  - Examples of product substitutions:
    - Non-pvc IV Bags (e.g.,McGaw Bags)
    - Non-pvc blood bags (in R & D)
    - Non-pvc tubing
    - Non-pvc ID bands
    - Non-pvc suction liners
    - Non-pvc Sharps containers (reusable polyethylene containers)
    - Nitrile gloves rather than Vinyl gloves

The Truth About PVC Recycling

Health Care Without Harm Campaign does not support PVC Recycling

- Consumer PVC products show the lowest recycling rates of any plastic. U.S. EPA estimates that less than 0.05% of the estimated 1.5 million tons of PVC in municipal solid waste was recycled (1995). According to the American Plastics Council, the total PVC recycling rate was 0.7% in 1995 and 0.9% in 1996.

- The Association of Post-consumer Plastics Recyclers, a recycling industry trade group, announced (April '98) that "efforts to establish long-term, economically viable markets for post-consumer PVC bottles, with the assistance of the Vinyl Institute, have proven unsuccessful…. PVC bottles are a contaminant to the recycling of PET and HDPE bottles."

The Truth About PVC Recycling

Health Care Without Harm Campaign does not support PVC Recycling (continued)

- PVC recycling is 2-3 times more expensive than the production of virgin PVC.

- PVC is unique in its high content of toxic additives (e.g. lead, cadmium, phthalates), needed to achieve the wide spectrum of PVC product applications.

- According to investigators who have inspected plastics recycling facilities in Asia, where most plastic is exported from the US, at least 1/3 of what is brought into most of the Asians countries is not recycled (it's getting burned or landfilled), while most of the rest is recycled into cheap low-quality goods.

Phthalate Ester Plasticizers

- Danish EPA stated that, “phthalates are the most abundant man-made environmental pollutants, & human intake per day, via various routes, is measured in tens of milligrams.” 1995

- Phthalates do not bond to PVC and leach readily.

- Dispersed into the environment mainly by becoming volatized & transported in the air. Global distribution, found in soil, air, water, sediments, animals and people. DEHP has been detected in pristine areas of the earth, such as Antarctica & in the center of the Pacific Ocean.

How Much Is Safe
vs
How Much We Get

- Total (Tolerable) Daily Intake (TDI)
  - European Economic Commission Scientific Committee on Food for DEHP is 0.2 milligrams daily for the average person.
  - TDI accepted under California's Proposition 65 Standard is 0.0 8 milligrams daily for the average person.
  - Estimated that the TDI from all sources of DEHP in the US is 5.8 milligrams per person per day (US Dept. of Health & Human Services, 1985)

Phthalate Ester Plasticizers

(continued)

In a letter to one hospital Baxter admitted:

(Baxter International Inc., is a medical products & services company)

- "In the past 35 years approximately 5 billion patients have experienced exposure to DEHP in the one-to-ten- milligram per day range for one to ten days per year. An additional 3 million patient years of chronic exposure at 5 milligrams per day, for one to ten years per patient, have also been accumulated."

  – (Therese Reisterer, Product Information Associate, Baxter, June 13, 1997 letter to Tim Washburn, Materials Management, Mercy Hospital, Rancho Cordova, CA)

Phthalate Ester Plasticizers

Cancer, Endocrine Disruption & Reproductive Toxicity

- Exposure for many people is probably above RfD (reference dose).
- DEHP is classified by the US EPA as a probable human carcinogen. International Agency for Research on Cancer (IARC) lists it as a human carcinogen.
- Causes liver tumors in rats and mice.
- The effects on the second generation are often greater than the first.
- Metabolite (MEHP) formed from the metabolism of DEHP is reported to produce testicular damage and is cardio toxic.

PVC Plasticizers & Endocrine Disruption

Emerging concerns about the phthalates esters is their ability to disrupt the endocrine or hormone system.

Several scientific studies have demonstrated that some phthalates, including butylbenzyl phthalate (BBP), dibutyl phthalate and diisononyl phthalate (DINP), are capable of binding to the estrogen receptor in human cell lines and of weakly mimicking the action of estrogen.

Phthalate Ester Plasticizers

(continued)

- Human exposure also occurs during medical treatment using equipment with DEHP-plasticized PVC plastic (IV bags, blood bags, tubing).

- Pregnant women, dialysis patients, and children may be at particular risk from DEHP exposure during medical treatment.

Ban News

- Concern about exposure to phthalates led the government of Austria to ban DEHP in packaging that has direct contact with food.

- In Denmark, the government banned the use of all phthalates in children's toys and childcare articles- 1998.

- In Switzerland, the use of DEHP for the manufacture of toys for children under the age of 3 was banned in 1986.

- In 1996 the American Public Health Association passed a resolution ("Prevention of Dioxin Generation from PVC Plastic Use by Health Care Facilities") calling upon hospitals to phase out their use of PVC.

More Children Are Getting Cancer

Among Boys:

- Bone Cancer up 40%
- Brain Cancer up 24%
- Leukemia up 10%
- Total Cancer up 13%

Among Girls:

- Bone Cancer up 33%
- Brain Cancer up 19%
- Leukemia up 21%
- Total Cancer up 10%

Comparison of cancer rates from 1975-1979 to the rates in 1987-1991

Source: Devesa, 1995

More Children Are Getting Cancer

(continued)

- "The increases [in the incidence of childhood cancer] are too rapid to reflect genetic changes, and better diagnostic detection is not a likely explanation. The strong probability exists that environmental factors are playing a role."

  Dr. Philip J. Landrigan, a pediatrician who directs the division of environmental medicine at the Mount Sinai School of Medicine. Dr Landrigan is also senior advisor to the new office of children's health at the U.S. EPA.

More People in the United States Have Reproductive Health Problems

- In some areas of the U.S. and the world men have about half the sperm count of their fathers. Sperm counts in men 27-38 years old, declined by 50% over the 20-year period 1973-1993.
  Shanna Swan et al, Environmental Health Perspectives 1997.

- Hysterectomies have increased 250% for women under the age of 44 with endometriosis. Five and one-half million women in the North America are effected by endometriosis. Research by the Endometriosis Association (EA) revealed a startling link between dioxin exposure & the development of endometriosis. EA discovered a colony of rhesus monkeys that had developed endometriosis after exposure to dioxin.

  Note: {In utero & lactational exposure of the male rat to dioxin (2,3,7,8-TCDD) impairs prostrate development. }Roman et al, Toxicology & Applied Pharmacology 1998.

Some Birth Defects Are Increasing

- According to a study by the Birth Defects Monitoring Program, more than 30 types of birth defects increased steadily during the 7-year period from 1979-80 to 1986-87. Heart defects increased the most.

- A quarter of a million U.S. babies are born with birth defects every year, according to a study conducted by the U.S. General Accounting Office.

- Incidence of undescended testes (cryptorchidism) has doubled since 1960. Giwercman et al, Environmental Health Perspectives 1993.

- Hypospadias, a birth defect in which the urinary canal opens on the underside of the penis, has also increased 100% since 1960. L. Paulozzi: Center for Disease Control & Prevention 1997.

Nobody's Exempt: The Role of Administrators in Controlling Waste

Kaiser Permanente * Mission Statement

- "Our mission is to improve the health of the communities we serve. Our resource conservation initiative is closely aligned with this mission because the health of the environment is an important factor in the health of the communities. We think of environmental protection as preventive medicine on a grand scale."

  David Lawrence, MD, Chairman & CEO of Kaiser Permanente

  *Over 9 million members in 19 states with 15,000 physicians.

Kaiser Permanente's Resource Conservation Initiative

- Purpose:
  - Ensure that all of KP's business activities are aligned with protecting the environment
- Goals:
  - Minimize waste
  - Prevent pollution
  - Conserve natural resources
  - Reduce costs
  - Model environmental protection practices

Health Care Without Harm Report

“Greening” Hospitals

An Analysis of Pollution Prevention
in America’s Top Hospitals

According to the report medical waste incinerators are among the top man-made sources of both mercury and dioxin emissions into the environment having wide public health impacts outside of the institution.

“Greening” Hospitals

- This study draws on survey results obtained from 50 of the nation’s top hospitals, derived from the list of the top 135 hospitals in the nation compiled by *U.S. News & World Report*.
- A first of its kind environmental survey uncovered widespread failure on the part of medical facilities to take steps to halt contamination of milk, meat, and fish by dioxin and mercury.
- Incineration of 2 million tons of hospital waste each year constitutes a major source of both of these pollutants (dioxin and mercury).

"Greening" Hospitals
Major Findings

- Of the hospitals that have mercury reduction programs, 37% of the hospitals still buy patient thermometers that contain mercury and nearly half buy mercury blood pressure devices.

- Over 40% of survey respondents continue to incinerate medical waste that should be treated by safer methods.

- Only 2% of hospital waste needs to be incinerated to protect the public health, yet some hospitals incinerate 75% - 100%.

- The average hospital is only recycling approximately one-third of the readily recyclable items. The most number of items recycled was 31; some hospitals recycle none.

"Greening" Hospitals
Major Findings
(continued)

- Almost 60% of the respondents report buying reusable goods over disposables where feasible, and 46% have packaging reduction programs in-place.

- 62% of the hospitals require vendors to disclose the presence of mercury in chemicals that the hospitals purchase and only 12% of the hospitals distribute mercury-containing thermometers to new parents.

Health Care Without Harm

"Greening" Hospitals Report

"Greening" Hospitals Report
is on-line at our Web site:

www.noharm.org

Practicing Dioxin and Mercury-Free Medicine

- Environmentally sound procurement policies
- Minimization of packaging
- Reusable instead of disposables
- Ongoing Red Bag Reduction Education
- Waste segregation
- Recycling
- Safe waste treatment choices (technologies)

Opportunities for Reuse in Health Care

- Built in eggcrate mattresses
- Reusable dishware and cutlery
- Reusable cloth underpads
- Reusable personal protection gowns
- Double sided copies
- Reusable inter-office mailers
- Reusable plastic or steel emesis and wash basins
- Reusable respiratory therapy equipment
- Rechargeable batteries
- Reusable packaging units -- tubs, totes, sharps containers

Resources for Health Care Facilities

- Lowell Sustainable Hospitals Project
  - Sustainable Hospitals Clearinghouse
    - » Provides technical support & research to health care facilities to purchase less toxic products.
  - Sustainable Hospitals Training Program
    - » Sectoral Education & Training
    - » In-Hospital Training
    - » National Sustainability Training
    - » Web Site: www.uml.edu/centers/LCSP
    - » Email: LCSP@uml.edu

Resources for Health Care Facilities

- National Medical Waste Resource Center
  - Non-incineration technologies for waste treatment
  - Provides information on:
    - reducing volume & toxicity of medical waste through waste stream segregation and minimization
    - eliminating hazardous materials
    - reducing waste management costs
- Web Site: http://www.nmwrc.com

Health Care Without Harm

Participating Organizations

- Action for Women's Health
- AFL-CIO
- American Nurses Association
- Beth Israel Health Care System
- Breast Cancer Action
- Blue Ridge Environmental Defense League
- California Nurses Association
- California Communities Against Toxics
- California, Nevada Board of Church & Society, United Methodist Church
- Cambridge Women’s Cancer Project
- Cathedral of Saint John the Divine
- Catholic Healthcare West
- Center for Health, Environment and Justice
- Center for Environmental Health
- Center for the Biology of Natural Systems
- Centre national d'information indépendante sur les déchets (CNIID)
- CGH Environmental Strategies

Health Care Without Harm

Participating Organizations

- Chemical Impact Project
- Citizens Environmental Coalition
- Citizens for a Better Environment
- Clean North
- Cleveland Earth Day Coalition
- Committee of Interns and Residents
- Commonweal
- Department of Environmental Health, Boston University School of Public Health
- DES Cancer Network
- Earth Day Coalition
- EarthSave
- Ecology Center of Ann Arbor
- Endometriosis Association
- Environmental Association for Great Lakes Education
- Environmental Stewardship Concepts
- Environmental Working Group
- Essential Action
- Farm-Verified Organic
- Fletcher Allen Health Care

Health Care Without Harm

Participating Organizations

- Galveston-Houston Association for Smog Prevention
- General Board of Church & Society, United Methodist Church
- Government Purchasing Project
- Great Lakes Center for Occupational & Environmental Safety and Health
- Great Lakes Natural Resource Ctr. National Wildlife Federation
- Greenpeace
- Hamtramck Environmental Action Team (HEAT)
- Human Action Community Organization
- Indigenous Environmental Network
- Institute for Agriculture & Trade Policy
- Jenifer Altman Foundation
- Judith Helfand Productions
- Kirschenmann Family Farms
- Learning Disabilities Association
- Legal Environmental Assistance Foundation
- Lone Star Chapter of the Sierra Club
- Massachusetts Breast Cancer Coalition
- Massachusetts Nurses Association
- Mid-Michigan Environmental Action Council
- MN Center for Environmental Advocacy

Health Care Without Harm
Participating Organizations

- Mt. Sinai School of Medicine
- Multinationals Resource Center
- Mumbai Medwaste Action Group
- National Environmental Law Center
- Natural Resources Defense Council (NRDC)
- National Women's Health Network
- North Carolina Breast Cancer Coalition
- NC Waste Awareness & Reduction Network.
- National Medical Waste Resource Center
- New England Medical Center
- New York State Nurses Association
- North Carolina Breast Cancer Coalition
- Ohio Network for the Chemically Injured
- Oil, Chemical and Atomic Workers Union
- Oncology Nursing Society
- Oregon Center for Environmental Health
- Physicians for Social Responsibility
- Pollution Probe
- Reduce Recidivism by Industrial Development, Inc..

Health Care Without Harm

Participating Organizations

- Reconstructionist Rabbinical Association
- Save Our County
- Science & Environmental Health Network
- Sierra Club
- South Bronx Clean Air Coalition
- South Carolina State Nurses Association
- Srishti
- The Breast Cancer Fund
- Toxics Action Center
- United Citizens and Neighbors
- 1199
- Vermont Public Interest Research Group
- Vietnam Veterans of America - Michigan Chapter
- Washington Toxics Coalition
- WEDO
- White Lung Association
- Women's Cancer Resource Center -- Berkeley, CA
- Women's Cancer Resource Center -- Minneapolis, MN
- Women’s Community Cancer Project
- Work on Waste